Status Report on Collaboration Work period 10 January-20 March-2008

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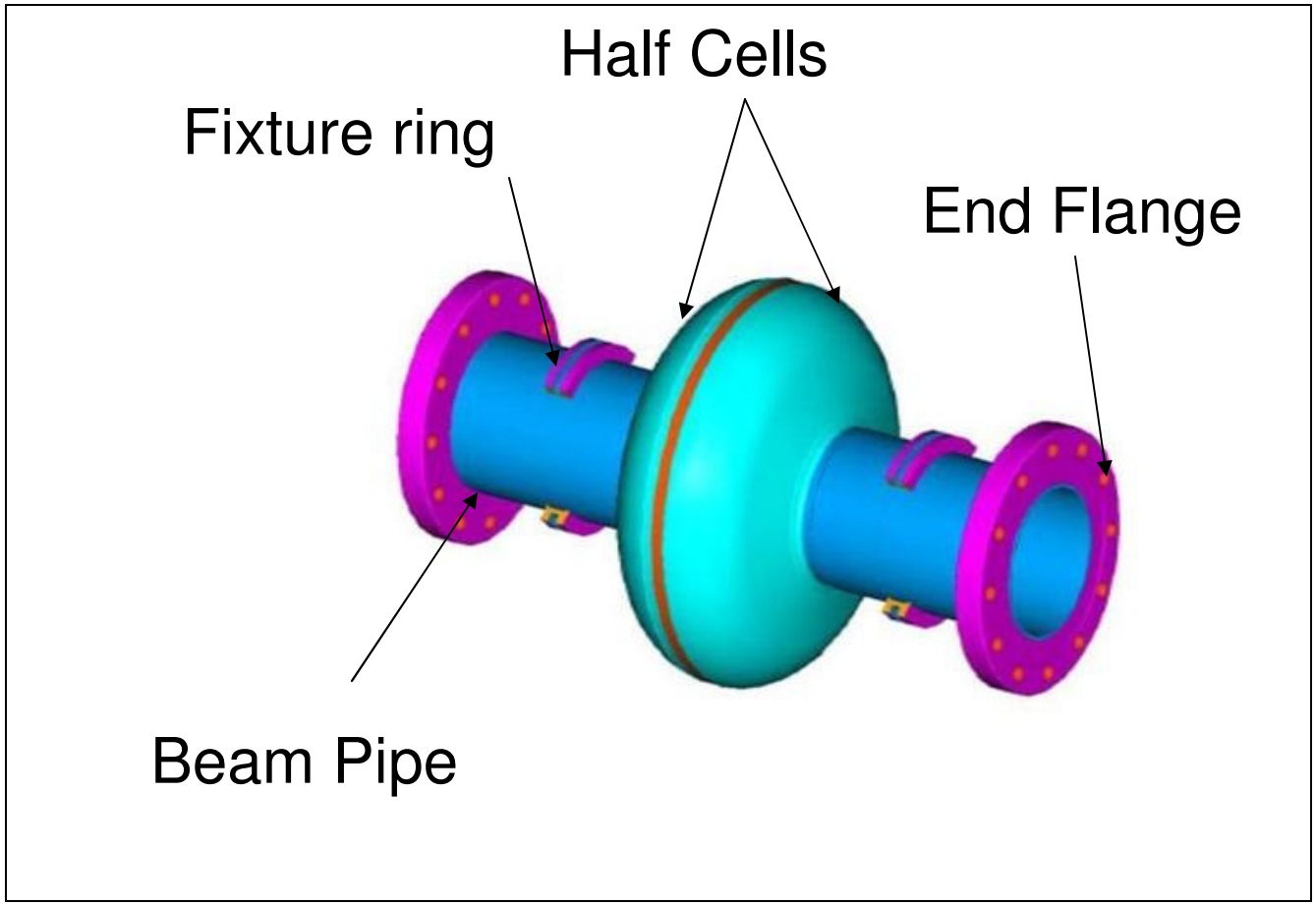
Meeting : March 10 2008

RRCAT Indore

Rolling of End Tube, Electron beam welding fixture
Slip ring concept & welding trials

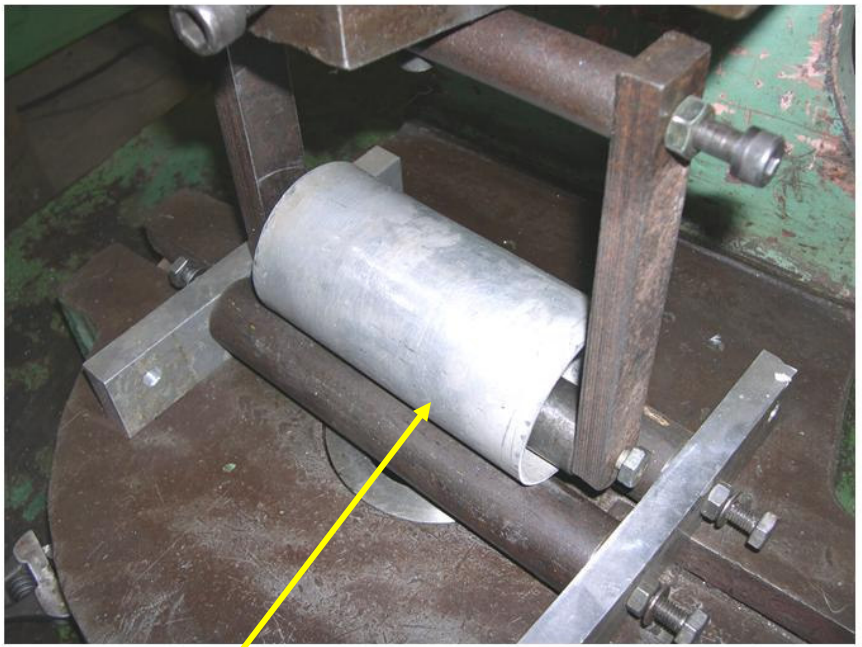


Model of Single cell TESLA shape cavity

Further to making of Half Cells efforts were initiated for making of end tubes:

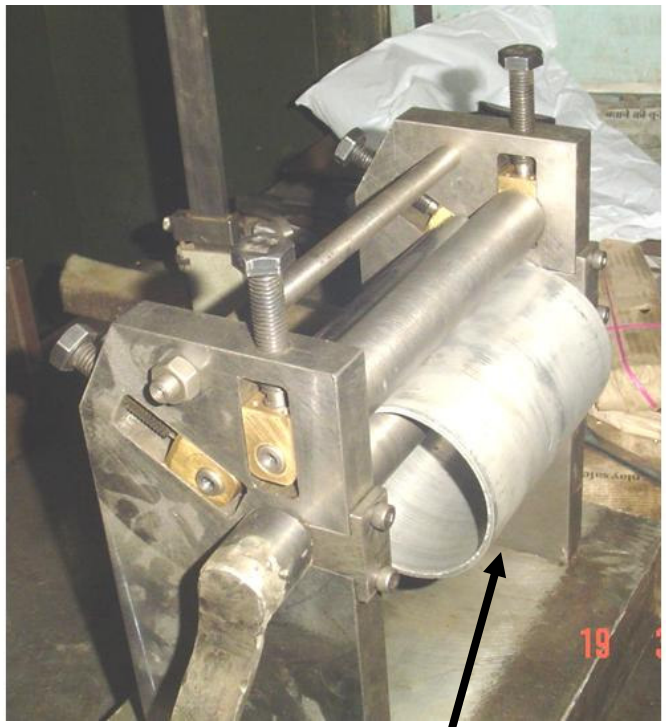
Two way approach was made for making of tube suitable for beam pipe

A manual sheet bending fixture was designed & fabricated for making end tubes.



Pipe rolling trial using
special jig & mechanical press

A dedicated sheet bending machine was also designed & fabricated for rolling of sheet.



Pipe rolling trial using dedicated machine

Since it is a compact & dedicated machine it is more suitable for clean room application required for the rolling Niobium sheet.

Dummy beam tubes of Aluminum rolled & welded at RRCAT workshop

Dummy beam tubes under inspection at RRCAT metrology Lab

20-Mar-2008 11:54 **CYLINDER NO-1 (VETICLE POSITION)**

(mm)	ACTUAL	NOMINAL	LO-TOL	HI-TOL	DEVIATION	GRAPHIC	ERROR
Temperature Compensation: OFF							
CYLNDR:CYLINDER-ID							
Diameter	78.0377	78.0000	-0.1000	+0.1000	0.0377	---+*--	
Cylindricity	**0.5743**	0.1000				+-->	0.4743
CYLNDR:CYLINDER-OD							
Diameter	84.0677	78.0000	-0.1000	+0.1000	6.0677	---+-->	5.9677
Cylindricity	**0.5311**	0.1000				+-->	0.4311

20-Mar-2008 09:36 **CLINDER NO-3 (IN VERTICLE POSITION)**

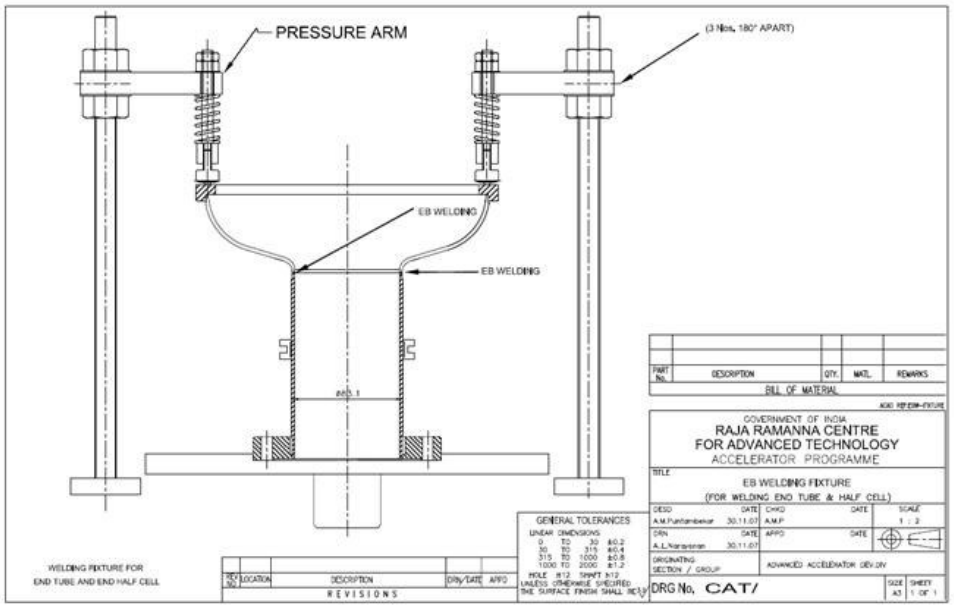
(mm)	ACTUAL	NOMINAL	LO-TOL	HI-TOL	DEVIATION	GRAPHIC	ERROR
CYLNDR:CYLINDER-OD							
Diameter	83.9021	85.0000	-0.1000	+0.1000	-1.0979	<--+---	-0.9979
Circularity	0.4014	0.1000				+-->	0.3014
Cylindricity	**0.4110**	0.1000				+-->	0.3110
CYLNDR:CYLINDER-ID							
Diameter	77.7787	80.0000	-0.1000	+0.1000	-2.2213	<--+---	-2.1213
Cylindricity	**0.6106**	0.1000				+-->	0.5106

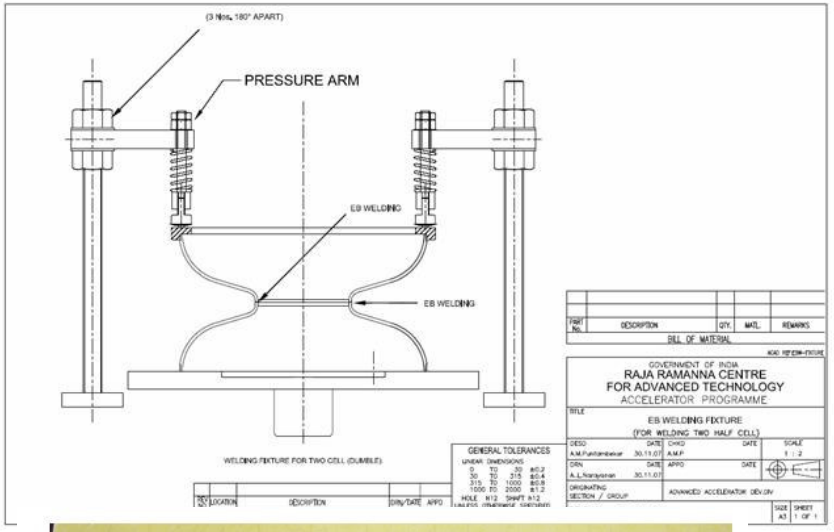
20-Mar-2008 11:41 **CYLINDER NO 2 (VERTICLE POSITION)**

(mm)	ACTUAL	NOMINAL	LO-TOL	HI-TOL	DEVIATION	GRAPHIC	ERROR
Temperature Compensation: OFF							
CYLNDR:CYLINDER-ID							
Diameter	77.8272	78.0000	-0.1000	+0.1000	-0.1728	<--+---	-0.0728
Cylindricity	**0.4801**	0.1000				+-->	0.3801
CYLNDR:CYLINDER-OD							
Diameter	83.9017	78.0000	-0.1000	+0.1000	5.9017	---+-->	5.8017
Cylindricity	**0.4985**	0.1000				+-->	0.3985

Design of Welding fixture completed & given to workshop for fabrication

- Machining of Fixture is underway at RRCAT workshop
- Expected to be ready by month end.

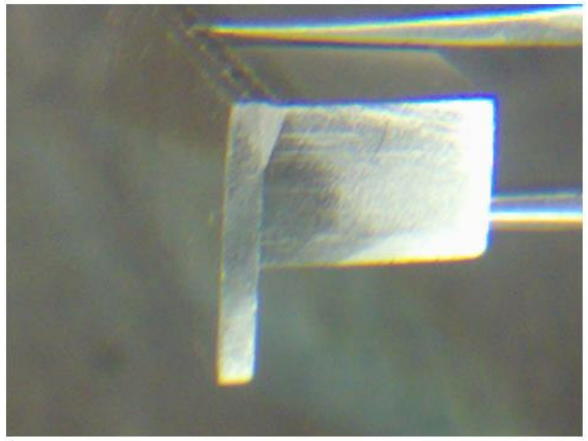




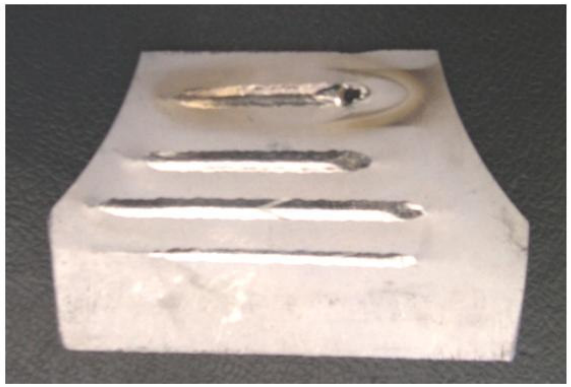
Ball Transfer Unit procured

Proof of principle planned on dummy set up using available turn table

For initial EB welding trials a private industry at Coimbatore has been located and a visit was made to the industry. They have shown interest in taking up the job of joining Nb using EBW in a collaborative R&D mode. This can help us in progressing on finalisation of different welding parameters, proving different welding fixtures etc.



Some preliminary welding trials conducted on test sample.



At the end of development of all the necessary tooling, we are now getting ready for taking forming, machining & welding trials on niobium

Support needed from Fermilab for Niobium material
This include the material required for Forming half cells, making beam tubes, end flanges & also for End group development from bulk Nb

• RRR300	Nb sheet 265 x 265 x 2.8 mm	Half cells	06
• RRR 40	Nb sheet 265 x 265 x 2.8 mm	Half cells	02
• RRR300	Nb sheet 150 x 270 x 2.8 mm	End tubes	06
• RRR 40	Nb sheet 150 x 270 x 2.8 mm	End tubes	02
• Nb55Ti	Rod ∅147 mm x 150 mm	Beam tube flanges	1 rod
• RRR300	Rod ∅140 mm x 125 mm	End Group from solid block	1 rod
• RRR40	Rod ∅140 mm x 125 mm	End Group from solid block	1 rod

We plan to make the parts and fixture for the single cell cavity & end group ready to weld & do the first EBW in collaboration with Fermi lab.

Thanks